A Multi-Method Exploration of Crime Hot-Spots: Visual Interpretation

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Crime Control Policies: Political Rhetoric or Empirical Reality?

[As an experienced crime analyst, unfamiliar with Baltimore County and it's crime patterns, Ms. Sorban was asked to visually determine what areas looked "hot" and to describe the decision making process involved. The CMRC provided her with four 24" X 36" paper "pin" maps; one for each crime type and level of focus. Points were aggregated on a grid to a 50ft. radius to eliminate hidden or overlapping points. Varying color "pins" indicated multiple incidents within the given radii. What follows is her discussion of the process. The emphases (**bold font**) have been added.]

As your letter specified, I've marked the "hot spots" that a non-GIS crime analyst might identify using the maps for burglaries and robberies that you sent. **Basically, with one of these maps as the sole indicator for hot spots, the only criteria in the decision process is a subjective visual judgement on the density of the pins and the presence of those pins representing the higher multiple occurrences within a 50 ft. radius.** It would be difficult to tell how much a better knowledge of the area would change that selection process. Without any other information, even the effects of street density would be hard to judge. For example, **I marked one or two long ellipses because the offenses appeared to linked by a major corridor street. But I might have broken that corridor up differently if I had even a general idea about the type of housing, commercial/residential land use, etc.** Analysts without GIS might not have access to the official demographics and land use on each area, but they would be expected to develop a working knowledge of the areas within their jurisdiction.

For example, **in the case of the burglary map, one or two of those pins representing 10-24 burglaries in a year should automatically call an analyst's attention** in Charlotte, since we have no high-rise residential neighborhoods to account for that kind of concentration. However, in an urban setting where that type of housing was the norm, an analyst might handle it differently.

Also, **few analysts with this large an area and volume of cases would have a pin map covering a full year of incidents.** Most would use some kind of rotating system so that they could see not only recent clusters but also any trends over time (decreases, increases, or possible displacement). For example, when we started our unit, we were dealing with trying to identify hot spots as the best locations to do immediate tactics like directed patrol rather than just identifying the areas where the most offenses were clustered. Our burglary

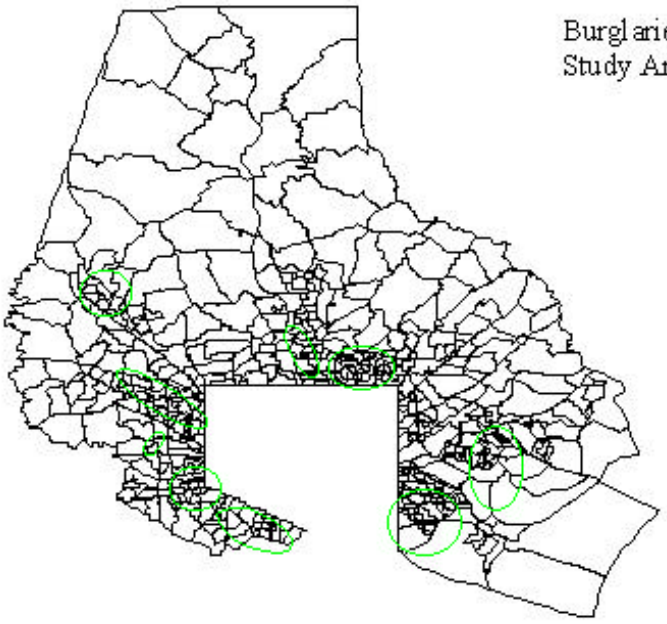
maps covered a four-week period, with each week represented by a color code. Under that system, a residential neighborhood with low density housing might be considered a current hot spot even with a relatively small number of cases, if the cases were currently increasing and involved similarities in how they were committed, what property was taken, etc. Robbery maps were set up on a longer rotation (three to four months) and sometimes incorporated the nature of the robbery (commercial or personal).

Although the **beginning point** [emphasis in original] in identifying a hot spot was a high number or an increasing number of cases in an area identified visually on the pin map**, the analyst would usually also have some other source of data to use in deciding if the area was indeed a hot spot.** We had automated weekly and monthly "problem area" programs that aggregated crimes by small areas. While these didn't give a spatial representation, they could be used along with the pin maps in making judgements. [Each of the 15 patrol districts in our jurisdiction, for example, was broken into smaller response areas constituting a patrol assignment area, and each of those was broken into "tracts" that were originally based on block groupings from the 1970 census. These tracts were the smallest geographic area by which we collected data; every offense would have been coded (assigned to a tract) based on the address.] The problem area program incorporated separate thresholds for each of the types of crimes we tracked: e.g., for any tract that reported more than 3 burglaries within a week, the printout would show those cases, their addresses, time/day of occurrence, property types, etc. Despite their individual shortcomings, using them together gave us a way to look for problem areas before GIS.

How an analyst selected a hot spot for further analysis would also have been affected by the use the identification would serve. Identifying the long-lasting hot spots to apply a community policing/problem solving approach or to produce some kind of "ranking" of areas by priority would probably involve a slightly different approach than looking for emerging hot spots to target quickly.

I guess what I'm saying is simply that **before GIS, the definition of a "hot spot" had as much to do with characteristics of the type of crime, the analyst's knowledge of the area, and the current increases/decreases as it did with the physical spacing or clustering of the offense locations.**

This may all be information that was already assumed in your project or may be out of its scope. But I wanted to be as complete as possible about the non-GIS process, at least as far as my experience goes.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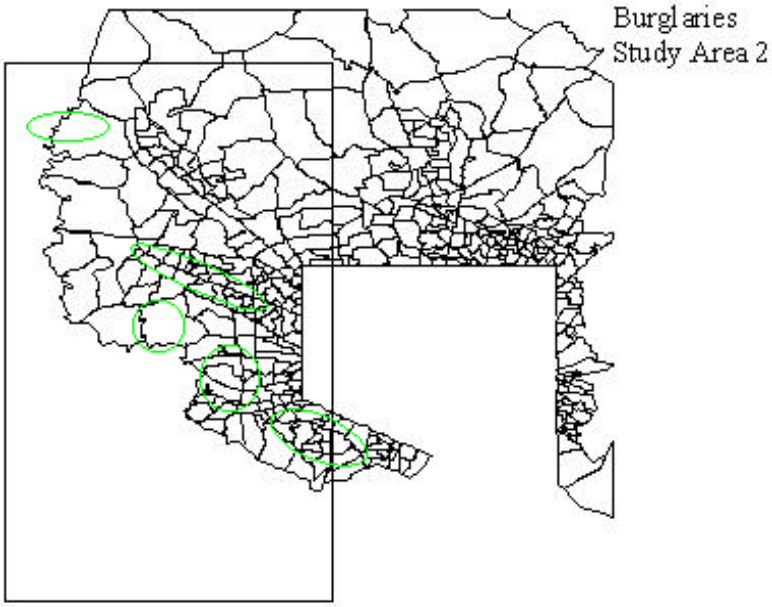
Study Area 1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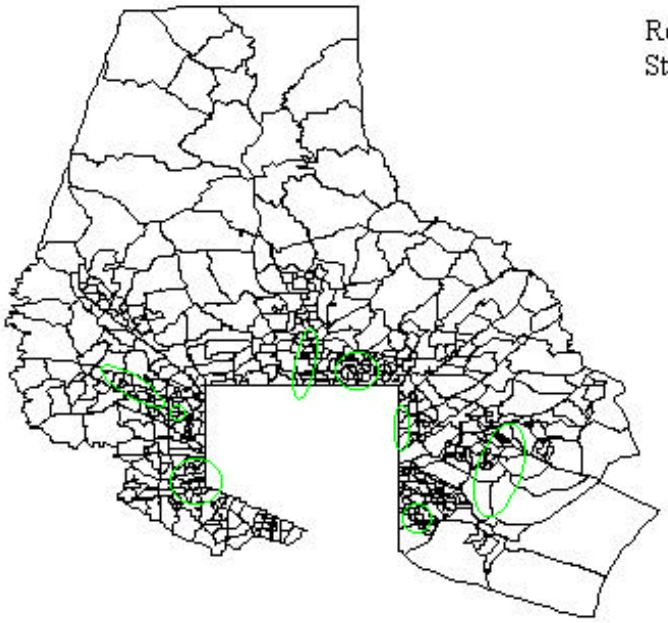
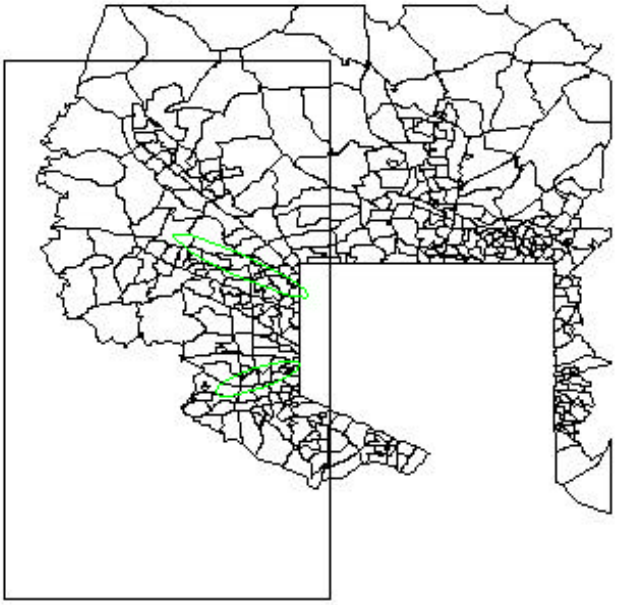
Study Area 2



Robberies
Study Area 1



Robberies
Study Area 2